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SHORT REPORTS

N-DOCOSANOYLANTHRANILIC ACID FROM *INULA OCULUS-CHRISTI*

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Key Word Index—*Inula oculus-christi*; Compositae; anthranilic acid derivative; fatty acids.

Abstract—The aerial parts of *Inula oculus-christi* afforded a new anthranilic acid derivative, acylated at the nitrogen by docosanoic acid.

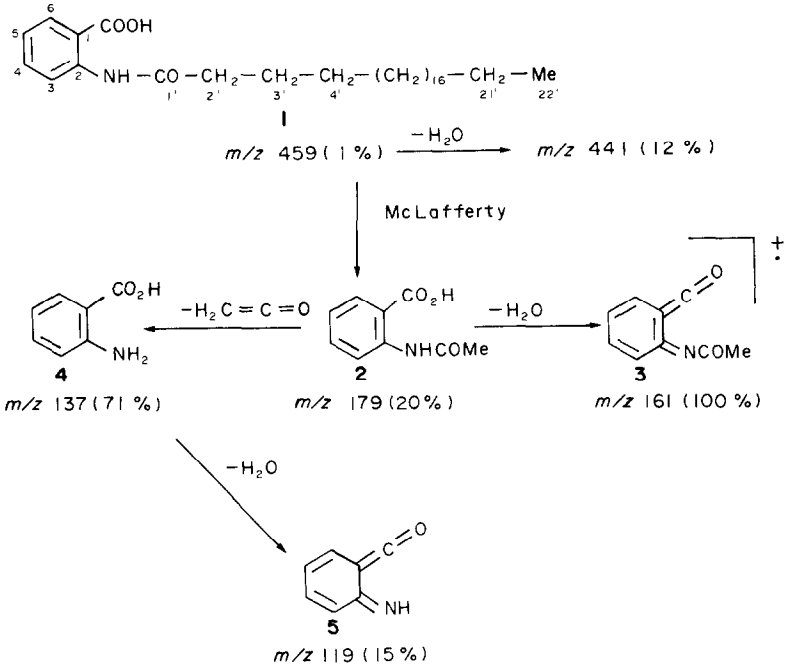
From the aerial parts of *Inula oculus-christi* L., in addition to the known sesquiterpene gaillardin[1, 2] and pulchellin C[3], a new nitrogen compound was isolated. The structure of **1** was assigned on the basis of spectral studies. The IR spectrum (KBr) contained intense bands for an *ortho* substituted benzene ring (1600, 1490, 1450 and 750 cm^{-1}) and amide and carbonyl groups (3350, 1707 and 1690 cm^{-1}). The ^1H NMR spectrum (Table 1) showed a broad singlet at δ11.0 which was assigned to an amide proton (exchangeable with D_2O). The broadened doublet (δ 8.77, J = 8.5 Hz) and a double doublet (δ8.14, J = 8.5 and 1.5 Hz) were assigned to H–3 and H–6 respectively, while the triplet (δ0.89, J = 6.5 Hz) was due to the terminal methyl group (H–22′).

The structure was further supported by the mass spectrum. The fragmentation of the molecular ion (*m/z* 459.371) gave the ions *m/z* 441.359, 179, 161, 137

Table 1. ^1H NMR spectral data of **1** (400 MHz, $CDCl_3$, TMS as internal standard)

H–3	8.77 *br d*	H–3′	1.77 *m*
H–4	7.60 *ddd*	H–4′–H–21′	1.27 *m*
H–5	7.12 *dd*	H–22′	0.89 *t*
H–6	8.14 *dd*	NH	11.00 *br s*
H–2′	2.47 *t*		

J(Hz): 3, 4 = 4, 5 = 5, 6 = 8.5; 4, 6 = 1.5; 2′, 3′ = 7.5; 21′, 22′ = 6.5.



Scheme 1. Mass spectral fragmentation of **1**.

and 119, which could readily be assigned as shown in Scheme 1.

Derivatives of anthranilic acid have not so far been reported from the Compositae.

EXPERIMENTAL

Dried aerial parts (leaves and stems 3 kg) of *Inula oculus-christi* collected in the flowering season, were extracted with MeOH and after evaporation the residue was chromatographed on a Si gel column. Elution with petrol–$CHCl_3$ (1 : 4) gave crude crystals of gaillardin (70 mg), and with $CHCl_3$ gave pulchellin C (50mg). Their structures were established by comparing the ^1H NMR spectra with those of authentic material. Further elution with $CHCl_3$–MeOH (23 : 2) gave crude crystals of **1** (40 mg) which were recrystallized from Me_2CO–petrol, mp 91–93°. IR ν_{max}^{KBr} cm^{-1}: 1600, 1490, 1450 and 750 (*ortho* substituted benzene ring), 3350, 1707 and 1690 (–CO_2H and –CON<), MS (70 eV): 459.371 $[M]^+$, (1) ($C_{29}H_{49}O_3N$), 441.359 $[M-H_2O]$ (12), 179 (**2**, 20%), 161 (**3**, 100%), 137 (**4**, 71%) and 119 (**5**, 15%).

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MONO- AND SESQUITERPENOIDS FROM *HYDROCOTYLE* AND *CENTELLA* SPECIES

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Key Word Index—*Hydrocotyle sibthorpioides*; *H. maritima*; *Centella asiatica*; Umbelliferae; monoterpenoids; sesquiterpenoids; allelopathy; chemosystematics.

Abstract—*Hydrocotyle sibthorpioides*, *H. maritima* and *Centella asiatica* were investigated for their terpenoid constituents. The major component of *H. sibthorpioides* and *H. maritima* is *trans*-β-farnesene. The latter species also elaborates α-terpinene and thymol methyl ether in respectable amount. The sesquiterpenoid constitution of *C. asiatica* is rather similar to *H. maritima*. Possible allelopathy between *H. sibthorpioides* and a liverwort is suggested.

INTRODUCTION

Hydrocotyle and *Centella* species (Umbelliferae) produce characteristic essential oils throughout the whole plant. It is known that *H. sibthorpioides* Lam. and *H. maritima* Honda have hemostatic and antitumor activities[1]. The latter species contains a flavonoid glycoside, hyperin[2]. *Centella asiatica* Urb. (*H. asiatica* L.) which is morphologically close to *Hydrocotyle* species produces biologically active triterpenoids with possible therapeutical use in ulcerations, extensive wounds and eczemas etc.[3–10].

Whenever *H. sibthorpioides* grows near the liverwort, *Marchantia polymorpha*, in the greenhouse the liverwort gradually dies. It is suggested that *H. sibthorpioides* and its related species may produce chemicals which inhibit the growth of liverworts. As part of a systematic study of biologically active terpenoids of plants, we have studied the chemical constituents of *H. sibthorpioides*, *H. maritima* and *C. asiatica*. In the present paper, we wish to report the distribution of mono- and sesquiterpenoids in the above three species.

RESULTS AND DISCUSSION

Whole plants of *H. sibthorpioides* and *C. asiatica* were extracted with diethyl ether after being air-dried and ground. *H. maritima* was divided into leaf, stem and flower and each part was treated in the same